Polytropic Models of White Dwarfs

Examples for use of the beamer package

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What are polytropes?

Solutions to...

The Lane-Emden Equation

$$\frac{1}{\xi^2}\frac{d}{d\xi}\left(\xi^2\frac{d\theta}{d\xi}\right) = -\theta^n(\xi)$$

A dimensionless, 2nd order nonlinear differential equation relating the pressure of a spherically-symmetric gas distribution to the radius.

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Placeholder

Alternate form of the Lane-Emden Equation

The Lane-Emden Equation may also be written:

$$\frac{d^2\theta}{d\xi^2} + \frac{2}{\theta}\frac{d\theta}{d\xi} = -\theta^n(\xi)$$

Translating to a system of 1st order equations

Translating this form to a system of 1st order equations:

$$\phi = \frac{d\theta}{d\xi}$$
$$\frac{d\phi}{d\xi} = -\frac{2}{\xi}\phi - \theta^n$$